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ABSTRACT

Self-conscious federal efforts to promote innovation in local educational practices have resulted in little consistent or identifiable improvement in student outcomes. Although such student outcomes may be disappointing, they do not accurately reflect the potential of innovative ideas because many innovations are not implemented according to plan. This interpretation of the problem stresses the complexity of the implementation process and locates the essence of the problem not in inadequacies of innovative plans but in the bureaucratic nature of the educational system itself. Therefore, improving educational results would require policies that promote change in the educational system and in the way it implements innovations. Without a systematic theory of planned change, however, federal policy has few reliable guidelines. As a requisite to Rand's proposed research, therefore, this report first assesses the literature comprising program and policy studies and then critically examines the analytical literature on planned change in education to select and formulate major theoretical issues. It then suggests an approach for investigating these research concerns and proposes a conceptual model of factors affecting change processes in a local school district. (Author/WM)

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FEDERAL PROGRAMS SUPPORTING EDUCATIONAL CHANGE, VOL. I: A MODEL OF EDUCATIONAL CHANGE

PREPARED FOR THE U.S. OFFICE OF EDUCATION,
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

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PREFACE

Rand is conducting, under the sponsorship of the U.S. Office of Education, a two-year study of federally funded programs designed to introduce and spread innovation practices in public schools.[1] These change agent programs normally offer temporary federal funding to school districts as "seed money." If an innovation is successful, it is assumed that the district will continue and disseminate part or all of the project using other sources of funds. The Rand study examines four such federal change agent programs—Elementary and Secondary Education Act Title III, Innovative Projects; Elementary and Secondary Education Act Title VII, Bilingual Projects; Vocational Education Act, Part D, Exemplary Programs; and the Right-To-Read Program. The study identifies what tends to promote various kinds of changes in the schools and what doesn't; in particular, the Rand study will identify for federal, state, and local policymakers the quality, permanence, and extent of dissemination of innovations that are associated with the various federal programs and with various federal, state, and local practices.

This report is the first of a series that will describe the results of the first year of the Rand study (July 1973–July 1974). The report provides a theoretical perspective for the Rand study by analyzing the current state of knowledge of planned change in education and by proposing the conceptual model of factors affecting change processes within school districts.

Volume II of the series (R-1589/2, *Characteristics of Change Agent Projects*) will contain the analysis of survey data collected by a national sample of 225 projects in 18 states during November and December 1973.

Volume III (R-1589/3, *The Process of Implementing Change*) summarizes the results of 30 case studies of change agent projects conducted by Rand staff members and consultants in 25 school districts during April and May 1974. These case studies were chosen from the original sample of 225 projects initially surveyed. Volume III also describes the role of state education agencies in choosing and disseminating change agent projects.

Volume IV (R-1589/4, *Synthesis of Findings*) summarizes the findings of Volumes I, II, and III, and also synthesizes extensive data collected by Rand on federal-level program strategy and management for each of the change agent projects. Volume IV also includes a discussion of alternative federal strategies for promoting innovation.

There will also be an executive summary volume that presents the study's methods and results for a general audience. Finally, there will be two technical appendices, one containing brief summaries of each of the 30 case studies analyzed in Volume II, and the second including a detailed description of the genesis, innovation strategies, and management styles of each of the federal change agent programs analyzed in this study.

The second year of the study will collect additional data on Titles III and VII of ESEA, with particular focus on projects whose federal funding has expired. The final report of the second year's work will be issued in December 1975.

[1] Because of Rand's interest in advancing knowledge of organizational behavior in educational institutions, the research underlying this report was supported in part by an allocation of Rand corporate research funds.

SUMMARY

Federally sponsored "change agent" programs[1] present an implicit challenge to the nation's education system. They imply that the status quo is inadequate in some respects and that change in local practices is required. In other words, these programs outline an objective of self-renewal that depends on translating the intent and spirit of these ambitious federal initiatives into effective new practices. But these federal change agent policies are constrained to some (unknown) degree in that they are *temporary systems* designed to work reform *from within or through* the existing educational system.

The relatively small amounts of money spent by change agent programs seem to have increased the *rate of adoption* of new projects, but to have had disappointingly little measurable effect on student achievement. Yet, it is not clear that adoption is a reliable forecast of *actual use*, or that the sorts of changes that are being implemented with federal dollars are those that would be expected, a priori, to lead to significant differences in student achievement. For example, if local schoolmen tend to view federal funds as contributing "slack resources" to their district, it is possible that these monies will be directed at ancillary services, not at the mainline educational activities that could significantly affect student outcomes. In fact, it may be that schools are being held accountable for something they cannot do given the present arrangement of policies, incentives, and institutional structures.

In addition, it is possible that "change" of the type desired by federal policymakers *is* taking place—but at a different pace than expected. It may be that change in local practice is both occurring at an incremental rate and is accumulating slowly across the system, and is thus overlooked because our present concepts of "change" are not sufficiently discriminating.

In light of these problems, the guidelines for designing effective federal change agent policies or evaluating their effect are unclear. This report turned to the literature and research on educational innovation specifically and organizational behavior generally to discover whether the state of the art (1) provided sufficient understanding of the innovative process to formulate effective policy or (2) suggested what research issues were important to develop a more adequate understanding of the process of innovation in education. The purpose of this report is to provide a theoretical perspective for the Rand study of change agent programs by

- Reviewing the empirical and theoretical literature on educational innovation.
- Identifying empirical and conceptual gaps in this literature, as well as the promising approaches.
- Proposing a conceptual model of the factors affecting change in local educational practices.

This analysis of the literature on educational innovations leads to the following assessment: (1) Research on the effectiveness of schooling and the possible causes of absolute and differential effects provides little guidance on how to change educational practices; (2) impact-oriented studies of innovative projects have not produced generalizable findings because they fail to deal with the interaction of the project

[1] Elementary and Secondary Education Act, Title III, Innovative Projects; ESEA Title VII, Bilingual Projects; Vocational Education, Part D, Exemplary Programs; the Right-To-Read Program.

with its institutional setting; and (3) implementation problems dominate the outcomes of change processes in the educational system. Therefore, we conclude that research should be directed toward understanding the implementation of innovative projects within school districts and how policy might affect implementation.

This literature review points out the need for a more systematic understanding of the process of implementation as well as several reasons why a theory of implementation is lacking. Because of the mutual adaptation of project and institutional setting, a theory of implementation would have to go beyond the details of the innovative project and incorporate characteristics of the complex organization as well. This leads us to speculate that rather than a single theory of implementation, a number of theories grounded in various discrete organizational realities might emerge. This suggests that research on the process of innovation in education should have multiple foci—namely, analysis of processes within LEAs, within SEAs, and within the federal level and the links among the different levels—and deal with two central inquiries: (1) the impact of innovative projects on the structure and processes of LEAs in order to identify those aspects of the educational system susceptible to being changed; and (2) the effects of aspects of the LEAs' structure and processes on the implementation of the innovative project both by kind and by degree. Because the organizational nature of the LEA plays such an important role in these inquiries, the following features should be examined in the research: the informal organization, unanticipated consequences of innovative projects, individual incentives and constraints, routinized behaviors, leadership, and the decision-making structure. And, in particular, these organizational features should be examined as they impinge on the implementation process. The report proposes that this process of innovation can be conceptualized as consisting of three stages: (1) support, (2) adaptation, and (3) incorporation.

The relationships involved in conducting research on the effects of strategies for educational change are very complex. Figure 1 (see page 19), which represents a conceptual model of the change process, illustrates how many elements are involved in the change process and how these elements interact with each other. Each stage of the process—initial support, adaptation, and ultimate incorporation as a permanent element of the LEA organization—is itself influenced by many factors, and the literature review offers a variety of conceptual measures of the variables that appear in the model. Thus, Fig. 1 should be viewed as a conceptual "map" of the network of relationships that affects the change process.

"Support" is seen as a function of project characteristics and LEA characteristics, community characteristics, SEA characteristics, and federal inputs.

Student outcomes at the individual level are a function of previous student outcomes, student characteristics, various influences on the student (family, peer group, community), projects characteristics, and changes in the institutional attributes as a consequence of initial and subsequent project characteristics, LEA characteristics, community characteristics, and project support levels.

The model describes project "implementation" in terms of the effects on the project of four sets of variables: initial project characteristics, initial institutional characteristics, institutional characteristics that have been altered by the project, and support levels.

"Incorporation," the degree to which the institution (LEA) "internalizes" the project, is a function of seven sets of variables: institutional changes brought about by the project, institutional characteristics that remain unchanged, project characteristics, student outcomes, community characteristics, SEA characteristics, and federal inputs.

This model reflects our belief that over time the innovative "plan" will become developed, operationalized, often revised, and, in short, "adapted," according to the realities of its institutional setting. With this reality in mind, we define implementation as the change process that occurs when an innovative project impinges on an organization. By so defining implementation, we shift the focus of research away from measuring compliance or the degree to which a project fulfills its stated "goals." Instead, we ask what changes actually occur as a result of the introduction of a new project, how and why they occur, and what significance these changes hold for the operation of the organization.

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I. INTRODUCTION

This study addresses one aspect of a broad problem identified by educators, policymakers, and critics of federal education policy alike. Self-conscious federal efforts to promote innovation in local educational practices have resulted in little consistent or identifiable improvement in student outcomes. A number of alternative (but not entirely exclusive) possibilities may explain the apparent failure of innovative practices:[1]

1. Schools are already having the maximum possible effect; new practices, then, cannot be expected to make a difference.
2. Innovative ideas and technologies tried thus far are inadequate or underdeveloped.
3. Change in student outcomes *has* occurred, but the measurement instruments are inappropriate or insensitive.
4. Innovative practices have not been properly implemented.

The weight of the first explanation, that schools are already doing the most they can, rests on the goals assumed for education. For example, those who see social equity as a major goal of education view the outcomes of the past decade's innovative efforts as persuasive evidence that new educational practices cannot reduce inequalities in rates of learning and achievement that accompany unequal background factors. Many holding this view have thus concluded that education is an ineffective and inefficient focus for federal intervention efforts and that the government should turn to alternative social policies to remedy social inequities.[2]

Others who also assume that a primary goal for education is reduction of social inequities contend that the present system is structured so as to preserve and perpetuate these social class differences, and thus that schools are working very efficiently. In this view, social equity can be achieved through schooling only if large-scale changes revolutionize the present educational system.

The second explanation assumes that schooling can be made more effective and interprets the apparent failure of new practices in terms of inadequate technology or underdeveloped practice. Some believe that present strategies are on the right course but that innovations have not produced the hoped-for results because they have not been adequately financed, developed, and not given sufficient time to mature. Others subscribing to this general explanation believe that present innovative practices are not succeeding because "best practices" have yet to be invented, and theories of learning or instruction are underdeveloped. The establishment of the National Institute of Education can be viewed as testimony to the belief that the

[1] The term "innovation" has been used by different authors—and often by the same author—to refer to a goal and a means, an object, and a process, an input, and an output. In this report, and in the Rand study, we define "innovation" as a practice or plan that is new to a particular school or local education agency (LEA) and that, because it is new, requires (or assumes) some degree of modification (or change) in the behavior of principal actors.

The very use of the word "innovation" frequently implies a value judgment that innovation is "good" in and of itself, and that the lack or rejection of proposed innovations is a sign of unwillingness to change. We intend no such implication; the focus of this analysis is on the *process* of change. Insofar as possible, our usage is neutral, so that the issue of what happens when a new practice is introduced into a district can be treated as independent of our belief about the value of that practice.

[2] This view is often called "Colemanism," because the disappointing outcomes of innovative projects were seen as confirmation of the conclusion many drew from the 1966 Coleman Report.

present shortcomings in educational practice can be remedied by concentrating more money and energy on basic research and theory development. Underlying the technological view is an assumption of a rational educational system eager to (and capable of) change. Thus, promoting improvements would require increased R&D investment, increased financing of local experimental projects, increased flow of information, and increased patience.

The third explanation focuses on the inadequacy or inappropriateness of pessimistic evaluations of innovative programs. Many people, especially educators, having direct involvement with innovative programs, argue that significant change in student outcomes *has* occurred but that evaluations fail to identify these changes because they suffer from some form of measurement error. Others holding this view make a somewhat different argument: that "change" of the type desired by federal policymakers *is* taking place—but at a different pace than expected. They contend change is occurring in *local* practices at an *incremental* rate and is *accumulating slowly* across the system, and is thus being overlooked. Both variants of this explanation contend that evaluations done so far are unsound or premature and cannot legitimately serve as a basis for the formulation of federal policies. In this view, accurate assessment of the effect of innovative programs awaits the development of more sophisticated and sensitive measurement instruments and research strategies.

A fourth explanation suggests that although the outcomes may be disappointing, they do not accurately reflect the potential of innovative ideas because many innovations are not implemented according to plan. This interpretation stresses the complexity of the implementation process and locates the essence of the problem not in inadequacies of innovative plans but in the bureaucratic nature of the educational system itself. This view sees the educational system as highly resistant to innovations, as likely to transform innovative projects into "new ways of doing the same thing," as generating much apparent *movement* but little effective *change* in local educational practices and, hence, little improvement in student outcomes. Therefore, improving educational results would require policies that promote change in the educational system and in the way it implements innovations.

It is not possible to further structure the problem of the effectiveness of innovation on the basis of the empirical evidence gathered so far. As the third view maintains, evaluations of innovative practices are beset with conceptual and methodological problems. Much of the evidence is contradictory; evaluations have been found to be incomplete or in error; important variables have been misspecified; dependent and independent variables are ambiguous; the relationship of treatment to educational goals is uncertain; and measurement or method is not comparable across studies. However, these empirical difficulties confound the fundamental problem: the absence of systematic theory of planned change.

Without such a theoretical perspective, federal policy has few reliable guidelines. Thus, the broad objective of the Rand study of change agent programs is to acquire a more systematic understanding of the process of innovation, generally, and specifically to identify the effect of these federal programs on local educational systems. As a requisite to Rand's research, this report analyzes the state of knowledge of educational innovations and proposes a conceptual framework for directing research.

Section II first assesses the literature comprising program and policy studies and, then, critically examines the analytical literature on planned change in education to select and formulate major theoretical issues. Section III suggests an approach for investigating these research concerns and proposes a conceptual model of factors affecting change processes in a local school district.

II. LITERATURE ON EDUCATIONAL INNOVATIONS

The literature on educational innovations is vast and may be increasing at a faster rate than the innovations themselves. Rather than presenting a thorough and comprehensive review of this immense and highly redundant literature, this section assesses the state of the art of knowledge about innovations in education. We wish to identify the main findings, the main issues, and the most promising conjectures. The literature on educational innovation can be divided into two broad categories: project or policy studies, and analytical treatments of the problems and processes of planned change in education.

PROJECT AND POLICY STUDIES

Most of the literature on change in education consists of single-case studies that evidence little methodological sophistication—research characterized by Giacquinta as the "show and tell" literature (in Kerlinger, ed., 1973). This large and widely dispersed literature chiefly comprises local education agency (LEA) project reports (many of which can be found in the Educational Resources Information Center (ERIC)); articles in education journals (such as *Teacher, Elementary School Journal, National Elementary Principal*); State Education Agency (SEA) and U.S. Office of Education (USOE) publications containing descriptions of "exemplary" projects (such as *American Education*, the "It Works" series; SEA annual reports of Elementary and Secondary Education Act (ESEA) projects); and compendia of "exemplary" or "innovative" programs (such as MacAdam and Fuller, eds., 1970).

The case study literature abounds with claims of "success," but data are seldom presented to document or support these conclusions. Indeed, the great majority of these reports more nearly resemble public relations documents rather than objective evaluations of project outcomes.[1]

Although there appears to be some agreement about which broad strategies have been "successful"—that is, individualized instruction, open classrooms, team teaching—on balance, this anecdotal literature is intriguing but it is neither convincing nor helpful to the issues addressed here. Because the case studies attempt to *describe* or *advocate* change—not to test theories of change or identify components of success or failure—neither success or failure can be understood in a way that enables educators or policymakers to learn from past experience. Furthermore, because these evaluations implicitly adopt a "project model" that looks at an innovative program apart from its institutional context, it is difficult to generalize project outcomes to other settings. In short, the case study literature paints project accomplishments in glowing broadbrush terms, but it provides little information about specific successful innovative strategies, about the components necessary to success, or even about what constitutes success.

Furthermore, the credibility of these evaluations is diminished by the fact that more detailed and sophisticated reviews and analyses fail to confirm these very encouraging conclusions. There is unsettling evidence that where "success" is

[1] An advocacy mode of reporting is not surprising, however, in light of the fact that this avalanche of project evaluations was precipitated by federal requirements to report, rather than by locally initiated inquiries into project accomplishments.

claimed, closer inspection reveals that the outcomes of projects are not statistically significant or they lack stability over time. For example, the American Institutes for Research (A.I.R.) (Hawkridge et al., 1968; Wargo et al., 1972) reviewed over 1000 supposedly exemplary programs to identify 100 candidates for further study. The subsequent in-depth investigations found that cognitive gains, where they could be certified, were not impressive and that the vast majority of the few programs that A.I.R. judged "successful" in one year did not demonstrate the same success upon reinvestigation in following years, even though the specified independent variables remained constant.

The Ford Foundation (1972) assessment of the activities and accomplishments of its heavily funded "lighthouse" projects underscores the same instability and short life reported by A.I.R. Ford Foundation evaluators discovered that between adoption and implementation, or between implementation and incorporation, innovations routinely disappeared or were modified beyond recognition.

There is also evidence that programs said to be installed in a school or district have never actually been implemented. For example, Goodlad and his colleagues (1970) found that many schools claiming to have individualized instruction had in fact merely adopted new labels for traditional practices, that reported changes were pro forma, and that the day-to-day activities and behaviors of teachers and others in the school setting remained fundamentally unchanged. (See also Mosbaek et al., n.d.; Wargo et al., 1972; Heller and Barrett, 1970.)

Nor does the high level of success reported for new strategies (by the case study literature) find support in those compilations or syntheses that assess the findings of research reports meeting more rigorous methodological standards. Gage (1963), for example, marshals an impressive amount of evidence from earlier years that suggests that innovative strategies to enhance student learning seldom produce impressive results. J. M. Stephens' review (1967) of innovative projects (instituted as long ago as 1897) also concludes that "new" educational practices seldom lead to variations in student outcomes:

> It is part of the folklore that, in educational investigations, one method turns out to be as good as another and that promising innovations produce about as much growth as the procedures they supplant, but no more [p. 10].

Travers (1973) and Averch et al. (1974), reviewing post-ESEA (1965) practices and innovations, fail to provide exception to these conclusions about the lack of differential effectiveness. Averch states, "Research has not identified a variant of the existing system that is consistently related to students' educational outcomes" (p. 171).

The widespread opinions about the disappointing lack of effectiveness of new educational strategies are not based primarily on these reviews, however. These judgments came about in response to the disheartening results of federally initiated inquiries into the effect of major federal education programs. Conclusions that "schools don't work" (to overcome background differences) and that "schoolmen don't know what to do" (with new federal resources) reflect in large measure discouraging evidence compiled by large-scale federal evaluations of the impact of project Head Start and ESEA Title I (Westinghouse Learning Corp., 1969; Mosbaek et al., n.d.; USOE, 1970; Glass, 1970; Wargo et al., 1972). These federally sponsored analyses were unable to identify a consistent or significant effect on student outcomes that could be attributed to participation in special programs funded with federal dollars.

As a result of the general lack of confidence in the anecdotal literature, and the disturbing evidence compiled by more rigorous or quantitative evaluations, two

negative conclusions predominate a review of the program and policy studies as well as the general commentaries on this literature:

- Variations in student outcomes have not been consistently related to variations in treatments, once nonschool factors are held constant.
- "Successful" projects lack stability and exportability.

These pessimistic assessments are subject to challenge on at least two grounds. First, it is perhaps unrealistic to expect either the absolute level of (mean) improvement or the rate of (mean) improvement to be high, particularly in the rather short time span of most innovative programs. It could be argued that given the highly stable nature of the educational system, one would expect to find only *incremental change* at the *leading edges*, and that such changes would *cumulate slowly*. The incorporation or institutionalization of the changes anticipated by federal policymakers, then, would be expected to occur gradually and over time, not in the October to May time frame employed by most evaluations.

Second, most of these studies suffer from serious methodological and conceptual difficulties that make pessimistic conclusions premature. Critical questions about their empirical validity have been raised and have not been satisfactorily answered. Since issues relating to the measurement instruments themselves and to the units of analysis have been widely treated, they will not be dealt with in this report (see, e.g., Levin, 1971; Cronbach and Furby, 1970). But we do want to stress that there may well be a specification problem that would cause these findings to be plausible; this possibility has received less attention than it deserves. That is, if an evaluation of a program yields results of "no significant difference," it may be that the project did not work, or it may be that all the important variables were not included in the evaluation model. Somewhere between the stated program inputs (which are specified) and the program effect (which is measured), important factors may be affecting the relationship between theoretical input and actual output, but are not specified. Insofar as unspecified variables have important first-order effects, their omission can produce a finding of "no significant relationship" between success and the variables that are specified.

Lack of stability and exportability of project outcomes may mean that the evaluation was in error, or that the project was a random success. Lack of a significant relationship between treatment and student outcomes may mean that the treatment was ineffective. Or, the absence of measurable effect and the lack of project stability may be the result of *unidentified causal variables* that change over time within and across sites.

It is possible that *institutional variables* are not identified in policy or project evaluations and that they change within sites as the institution adapts to the project; they certainly vary across sites. Further, the project itself, as we will discuss later, can be expected to change over time, as the institution modifies the innovative strategy to accommodate the institutional structure and constraints. Thus, the simple input/output model implicit in most studies of innovative strategies could be expected to underestimate the effect of the treatment to an unknown degree. It is likely that simultaneous effects occur in the process of implementing an innovation and that endogenous relationships are important to an accurate assessment of project effect.[2] Where treatment and institutional variables are considered together in a series of simultaneous equations, institutional variables may be found to have a significant relationship to project outcomes, and, more important, treatment may

[2] We will offer a conceptual model of the process of implementing an innovation in Sec. III. This model will specify (schematically) what relevant simultaneous effects might be.

then be significant. In other words, technical problems of measurement may result in masking significant effects of innovative projects.

In sum, the findings presented by the program and policy studies do little more than suggest the overall problem—that of the apparent ineffectiveness and instability of innovative efforts. But this literature provides no help in casting the problem in comprehensive and operational terms. On the basis of this literature we were unable to decide to what extent the problem is an artifact of measurement error; is evidence of inherent limitations in production possibilities; is the result of implementation problems; is the result of slippage between treatment and goals; or is the product of premature assessment. In short, the evaluation literature marshals voluminous data that suggest serious difficulties in past efforts to bring about change in educational practices, but because of its project orientation and atheoretical character, this literature does not permit us to generalize from past experience or even to specify the nature of the problem in theoretically fruitful terms.

ANALYSES OF PLANNED CHANGE

The program and policy studies concentrate on the relationship between treatment variables and student outcomes; the analytical literature on planned change in education focuses instead on the *institutional aspects* of educational innovation.[3] This literature asserts that there are institutional factors that influence the success or failure of an innovative effort—quite apart from the "quality" of the innovative strategy itself. Although there is general agreement on this point, there is disagreement about which aspects of institutional behavior should be emphasized, and about how the problem of effecting planned change should be stated; one analytical approach emphasizes *adoption;* a second focuses on *implementation.*

The Adoption Perspective

The dominant school of thought concentrates on information development and utilization, and tries to formulate and specify management principles that might facilitate the adoption of educational innovations.

Ronald G. Havelock (n.d.) has synthesized the elements of this perspective into four alternative models. Each model focuses to some extent on *preadoptive* behavior, the behavior of schools before a decision to adopt is made, and on the "insufficient rationality" thought to attend planned change efforts.

The first model, the Problem-Solving model, assumes that user needs are paramount in selecting and adopting an innovative strategy. This model of planned change casts innovation in a "diagnostic" frame, and emphasizes search and selection processes. Demonstration of congruence between an innovative strategy and diagnosed need is presumed to result in adoption.

The second model, the Social Interaction model, focuses on patterns of diffusion, and assumes that information in itself is an important (if not major) source of motivation to innovate. Exposure to information about a "bettter" practice, then, is expected to lead to adoption or trial.

[3] Theoretical literature from outside the area of education, notably organization theory and the diffusion literature, has often been used by individuals concerned with educational innovation and with the formulation of theories of change. Widely cited are the works by Bennis, Benne, and Chin, 1969; Bennis, 1966; Cyert and March, 1963; Rogers, 1962; Rogers and Shoemaker, 1971. We are not specifically treating this theoretical literature in this section. Instead, we are concerned with the literature that deals specifically (and practically) with the problems of planned change in education implied for the Rand study.

The third model, the Research and Development model, is an explicitly rational model that assumes a rational sequence of goal setting, planning, implementation, and evaluation. As in the preceding two models, emphasis is given to needs assessment and the motivational aspects of information. This model assumes that the "consumer" is a more or less passive (but rational) receiver and implementer of ideas that seem to meet his needs.

A fourth model, the Linkage model, has been developed by Havelock to remedy the deficiencies he perceived in the preceding models. It draws from the preceding three, but, in addition, deals with the incentives, behavior, and goals of individual actors in the educational institution, in response to proposals for planned change. Havelock's "linkage model" begins to introduce notions of more realistic administrative behavior (e.g., Simon, 1965), but this model, like the other models, focuses almost exclusively on how people behave and how institutions are characterized *before* an innovative strategy is implemented. Thus in this model, too, the problem of effecting change is framed primarily in terms of bringing about the adoption of an innovation.

Underlying these four concepts of effecting educational innovation is a rational model of bureaucratic behavior that assumes that schoolmen constantly seek better practices, have reliable means of identifying superior procedures, and are eager and able to adopt proved innovations. Thus, given the existence of promising strategies, the primary barriers to change are seen as deficiencies in

- Planning, communication, and dissemination.
- The quantity and quality of available information.

The Adoption Perspective: Conceptual Problems

In our opinion, this rationalistic view of educational innovation is unsatisfactory in some important ways. First, the formulation doesn't explain the *modal* process of change in educational institutions. It focuses on questions of adoption, planning, and dissemination, and tends to ignore the issue of implementation or institutional adaptation of an innovative strategy. But without that, we cannot learn from the success or failure of attempts to innovate; nor do we have a basis for deciding when change has actually occurred.

Second, the educational system does not have the selection mechanism assumed by the rationalistic perspective. Public schools do not have a market-type selection mechanism, or "profit maximizing" incentives; the "survival" of the institution is guaranteed by society. Within a LEA, there is no clear incentive to innovate, because LEAs that do not innovate aren't likely to "fail." Further, LEA staff members have few incentives to initiate change when outcomes of innovation are uncertain and when changing bureaucratic patterns involve personal risk. Indeed, there is broad agreement that the following characteristics of the educational change process hold, even though they are not consistent with the rational view:

- Decisions to adopt or reject an innovation are seldom made on the prima facie merits of the innovation (Miles, 1964; Coleman, 1972; Rein, 1970).
- The usual process of change is from the top down; pressure for change is typically initiated outside the local school rather than by assessments of school needs (Fullan, 1972; Sarason, 1971; Bennis, Benne, and Chin, 1969; Wirt and Kirst, 1972).

Thus, the special instance of the educational innovation suggests that many of the rationalistic assumptions about the role of information and the impetus to adopt

innovation are not consistent with the reality of decisionmaking in the local school setting.

Third, this approach, which locates the essence of the problem of change in adoption, does not square with experience or with the conclusions of more theoretical treatments of educational innovation. There is persuasive empirical and theoretical evidence that suggests that adoption is only one—and in most instances not the most important—hurdle to overcome in successfully bringing about change in educational practices.

The Implementation Perspective

In contrast with the adoption perspective, a second school of thought on planned change defines the problem of successful innovation in terms of *implementation*. This variant of an institutional approach is represented by a small number of theorists who have examined the reality of educational innovation from the perspective of an *organizational* model of institutional behavior. This research has begun to explore the dynamics within the institution and the characteristics of innovative strategies that affect the possibility of effecting planned change.[4]

The analytical case studies of educational innovations find on inspection that the most difficult and complex part of the problem of innovation has to do not with *preadoption* behavior but with *postadoption* behavior, or with the process of *implementation*. In almost all the instances studied, adoption was not at issue; problems of implementation dominated the outcome and the success of the innovative projects. The innovations typically were initiated with a high level of enthusiasm and support by faculty and staff, but these innovative plans failed to achieve their objectives because of unanticipated and often prosaic difficulties and obstacles encountered during the course of project implementation.

In addition, the organizational perspective on planned change contends that "resistance" to change persists after a decision to adopt is made, continuing to exert influence throughout the process of adaptation and implementation. This model stresses the "dynamic conservativism"[5] of the school system. Thus, the regressive tendency of the system to fall back into pre-existing, or only marginally different, patterns of behavior after the adoption of innovative strategies is seen simply as symptomatic of the fundamental character of the institution.[6,7]

This somewhat different formulation of the essential problem of planned change —implementation as opposed to adoption—has led to the identification of a different set of dimensions, which may be important to an understanding and promotion of successful change in educational practices. Although the role of information is not dismissed, in the organizational perspective the role of "knowledge" and communication in the outcome of an innovation is seen as less important than and dependent on

- The role of principal actors.
- The institutional structure of incentives and constraints.

[4] See Miles, 1964; Gross, Giacquinta, and Bernstein, 1971; Sarason, 1972; Smith and Keith, 1971; Carlson et al., 1971; and Charters et al., 1973.

[5] This term is used by Schon, 1971.

[6] This institutional attribute provides one explanation for the lack of stability of "successful" projects found by Wargo et al. (1972), as well as insight into the phenomenon of "pro forma" change (Goodlad et al., 1970).

[7] Ginsburg et al., ca. 1970; Coleman, 1972; Charters et al., 1973; Wirt and Kirst, 1972; Kirst, 1972; Miles, 1964.

- The institutional policy setting.
- Characteristics of the innovation.

The lack of congruence between rationalistic models of change (such as those synthesized by Havelock, n.d.), and what other researchers and theorists (see especially Miles, 1964) describe to be the dominant problem of innovation, can be attributed in large measure to their somewhat disparate intellectual traditions. Whereas researchers such as Sarason (1971), Smith and Keith, Charters et al., and Gross et al. have attempted to structure the problem of educational innovation inductively, the rationalistic perspective has for the most part deductively formulated management principles to guide innovation. The principles of knowledge utilization and production so developed rely heavily on the traditions and assumptions of the diffusion literature—a conceptual framework that has only very general and limited application to innovation in education (see Rogers, 1962; Rogers and Shoemaker, 1971; Havelock, 1969).

Drawing primarily from the fields of medicine and rural sociology, the diffusion literature frames the central problem of innovation in terms of *adoption,* and the central issue for analysis as the identification of differential *rates of adoption.* Underlying this view is the assumption that an "innovation" is a relatively stable "technology" or "product," and that, once adopted, an innovation will generate its own momentum and proceed more or less mechanically through predictable stages of implementation, which will end with a decision to continue or terminate. Innovative strategies, then, are presumed by the diffusion literature to be essentially "self-winding"; an innovation's prima facie merits are assumed to be their own brief.

On inspection, however, there are important practical differences between a "technology" and an educational innovation. These dissimilarities raise questions about the relevance of the diffusion literature (and its assumptions) for innovation in education. A technology or a product can be thought of as possessing the following general attributes:

- Clarity and specificity of goals.
- Specificity of treatment.
- A clear relation between treatment and outcome.
- Passive user involvement.
- A high level of certainty of outcome.
- A unitary adopter.

Because of these characteristics, a technology or a product is usually *invariate* in its implementation and in its outcome from one context to another (see Gruber and Marquis, 1969).

In contrast, innovative strategies in education (unlike technologies—a new pill, a new airplane, or a new hybrid seed) tend *not to be invariate.* Theorist Matthew B. Miles (1964) argues, for example, that educational innovation should be thought of as evolutionary: "The installation of an innovation in a system is not a mechanical process, but a developmental one in which both the innovation and the accepting system are altered" (p. 647).

In fact, in comparison with "technologies," educational innovations may be said to possess the following general attributes:[8]

- Treatments are incompletely specified.
- Outcomes are uncertain.

[8] See Sarason, 1971; Fullan, 1972; Weiss, 1972; Rossi and Williams, 1972; Gross, Giacquinta, and Bernstein, 1971.

- Active user involvement is required.
- The adopter is not unitary but a policy system or policy units.
- The relationship of project treatment to overall institutional goals is *un*clear or unspecified.

Although one can point to technologies that have been called educational "innovations" (e.g., some kinds of audiovisual equipment or computerized accounting procedures), unless the adoption of such educational hardware anticipates a concomitant change in patterns of behavior, we will argue that these products are not innovations. Even innovations that are primarily technological in nature are subject to the host of implementation problems (although to a lesser extent), which attend innovative strategies focusing on explicit behavior changes or require extensive new learning on the part of the user (e.g., differentiated staffing projects).

Because of the nature of an educational innovation, the decision to adopt does not resolve the problem of innovation; this decision is only the beginning of a process that exhibits a high degree of instability and variability.[9] Experience has shown that innovative strategies not only change over time within sites, but that they also display an enormous amount of variability from one institutional setting to another.[10]

The variability in institutional response to an innovation—the result of different sets of actors and different institutional patterns of routinized behavior—creates what we will call a "*mutation phenomenon.*" That is, innovation A^1 may become innovation A^2 when it is implemented in another setting, and it may be again changed to become A^3 as it is carried out at yet another site. Or, innovation A^1 may become innovation A^2 or A^3 over time within the same site. Further, a panel of independent observers (or even the participants themselves) would be unlikely to reach agreement as to whether or not—in operation—$A^1 = A^2 = A^3$.[11]

In sum, the nominal adoption of an innovation cannot be assumed to provide an accurate forecast of its actual implementation or use. The process of implementation in the instance of educational innovation is essentially a two-way process of *adaptation*, in which the innovative strategy is modified to suit the institution, and the institution changes to some degree to accommodate the innovation. Therefore, the implementation of educational innovation can be thought of as an *organizational process* whose end product, in the case of a successful innovation, would be an altered institutional arrangement and an innovative strategy modified to suit that arrangement.

The existence of this mutation phenomenon underscores the extremely limited utility of program and policy effect studies that look only at the relationship between treatment and student outcomes. As Levin (1971) argues:

> the lack of similarities among the production techniques used by different schools may mean that neither average nor frontier findings can be applied to any particular school. Indeed, in the extreme case, each individual school is on its own production function, and evaluation results for any group of schools will not be applicable to individual schools in the sample [p. 23].

[9] In fact, the sheer volume of the anecdotal case study literature provides evidence that adoption is not a problem.

[10] In an analysis of the Head Start/Follow-Through Planned Variation Experiment, which was designed to test the differential effectiveness of explicitly different models of education practice, Huron Institute staff (Cambridge, Mass., n.d.) found that model-to-model comparisons were extremely difficult to make because of the high degrees of variability that occurred *within* each specific model as it was implemented in multiple sites.

[11] We note that the educational system does not possess—at least in the short run—a "survival of the fittest" mechanism that would select out undesirable mutations.

The highly variable and unstable nature of educational innovations implies that it is misleading as well as unfruitful to evaluate the effectiveness of an innovative strategy apart from its institutional setting; and also that both the nature and the outcome of an innovative plan are determined by the complex and little-understood process of implementation.

If it is true that innovations are not invariant but adapt to the institution, as well as lead to modifications in the institution, it is possible that educational innovation may take place in a nominalistic world, in which comparisons and generalizations are risky at best. On the other hand, it may be that what are substantively different "changes" of innovative plans can be seen as the product of common institutional structures and processes. If this is the case, questions of implementation and patterns of institutional response to innovations become central to identifying policy levers that can affect the incidence and outcome of innovation as well as to understanding systematically the process and outcome of planned change in education.

III. AN ANALYTICAL APPROACH TO STUDYING IMPLEMENTATION

Our analysis of the findings and failings of the state of the art of the literature on educational innovations leads to the following assessment:

1. Research on the general effectiveness of schooling provides little guidance on how to change educational practices.
2. Impact-oriented studies of innovative projects have not produced findings that can be generalized, because they fail to deal with the interaction of the project with its institutional setting.
3. Implementation problems dominate the outcomes of change processes in the educational system.

Therefore, we believe research should be directed toward understanding the implementation of innovative projects within school districts, and how policy might affect implementation.

This section offers an analytical framework that could guide research and serve as a precursor to a theoretical understanding of implementation of educational innovations. We will suggest elements of the institutional structure of the educational system that are essential to analysis, an approach to studying the change process, and a conceptual model of factors affecting change in the educational system.

DEFINING IMPLEMENTATION

Unfortunately, there is no theory or analytical understanding of implementation in the educational literature or in other literature (Pressman and Wildavsky, 1973). At best, educational experts have accumulated wisdom in the form of principles, guidelines, and advice for change agents (Havelock, 1973). Without denying the validity of any particular common-sense procedure, such advice usually suffers from both inconsistency and incompleteness: Implementers are often faced, on crucial matters, with principles leading to divergent alternatives, and inadequate information (and understanding) to choose among them. The need for a more systematic understanding of the process of implementation is evident.

Our preceding discussion suggests several reasons why a theory of implementation is lacking. Because of the mutual adaptation of project and institutional setting, a theory of implementation would have to go beyond the details of the innovative project and incorporate characteristics of the complex organization as well. This leads us to speculate that rather than a single theory of implementation, a number of theories grounded in various discrete organizational realities might emerge. In any event, it seems evident that implementation is an organizational process and to model this process requires a theoretical understanding of the organization itself.

A second reason why implementation has resisted conceptualization is because it implies social change of an evolutionary character. Sociologists and political scientists have been more successful in describing stable systems and their mechanisms for resisting change than in modeling how complex organizations change.[1]

[1] Stinchcombe, 1965; Huntington, 1971.

Moreover, the types of change contemplated by most "innovative" projects are evolutionary changes in existing stable systems. Such change often results from the accumulation of many small, undramatic modifications that individually hardly seem worth scientific scrutiny. Rather than the fascinating crisis decisions of the President, the "decisions" in implementation are mundane and incremental, and often in response to continuing problems coped with daily by many individuals, each of whom only affects the process and outcomes marginally. If a theory of implementation is to be formulated, it would have to capture how, and under what conditions, these sequences of problem-solving activities cumulate to produce basic or marked change.

A third explanation for the absence of an analytical understanding of implementation arises from a problem of definition. Perhaps the most common, though often implicit, meaning of implementation is an administrative one—to implement is to carry out a directive. In this sense, implementation is a problem of obtaining compliance with a command in an organization, with a law in a political system, or with a set of procedures on a project. Thus, research focuses on why subordinates fail to obey. Whatever value this orientation may have in some contexts, it misconceives the essence of the implementation of an innovative project in a complex policy system such as American public education.

An innovative project is a plan with a statement of goals and means designed to change standard behaviors, practices, or procedures.[2] Projects differ, of course, in how concretely goals are specified and in how detailed means are articulated. As previously noted, certain kinds of educational innovations tend to have abstract goals, to lack specificity and clarity of means, and to have considerable uncertainty as to the relationship between means and ends. Such uncertainty makes it inevitable that during its implementation, the "plan" becomes developed, operationalized, often revised, and, in short, changed according to the realities of its institutional setting.[3]

With this reality in mind, we define implementation as the change process that occurs when an innovative project impinges upon an organization. By so defining implementation, we shift the focus of research away from measuring compliance or the degree to which a project fulfills its stated "goals." Instead, we ask what changes actually occur as a result of the introduction of a new project, how and why they occur, and how they affect the operation of the organization.

THE DECENTRALIZATION OF IMPLEMENTATION IN EDUCATION

The sheer complexity of the educational system makes the issue of how research should be focused a major concern. At one end, we are interested in the ways in which federal policy can affect education; at the other end, we need to investigate how specific innovative projects affect students. The ideal theory of implementation would explain (or predict) how federal policy works its way through the various levels and jurisdictions of the educational system down to the teacher in the class-

[2] This definition is consistent with the concept elaborated by March and Simon (1958): "Initiation and innovation are present when change requires the devising and evaluation of new performance programs that have not previously been a part of the organization's repertory and cannot be introduced by a simple application of programmed switching rules" (p. 175).

[3] Barnard (1938, p. 206) succinctly describes this organizational process as "successive approximations."

room. Accomplishing this ideal is unlikely. Rather, research should begin with a more realistic assessment of the political interdependencies and the balance of power throughout the system. Accordingly, this section suggests what aspects of the overall system should have priority for research and what simplifying assumptions can be made.

The elementary and secondary education policy system is an organization of organizations—a *multiorganization* —in the sense that it is composed of

- A variety of operational units, each having its jurisdictions and responsibilities, both vertically and horizontally.
- Operational units tied together by a common institutional framework.

Even excluding such ancillary groupings and organizations as community groups, graduate and professional schools, technical schools and colleges, professional associations and teachers' unions, the list of operational units is impressive in number and variety of functions:

- The classroom
- The school
- The local education agency (LEA)
- The state education agency (SEA)
- Federal agencies

A major characteristic of the American educational system is the high degree of autonomy of each of these "levels" or units of organization (Wayland, 1964). For example, in some crucial ways, the teacher is "alone" in his classroom, and the delivery of his services rests on how he teaches. At the school level, the principal fundamentally affects, and has responsibility for, such system problems as social control, the sequential organization of programs and activities, allocation of staff and resources, and the attainment of goals set largely by other levels of organization. At the LEA level, the school districts (as operated by superintendents who are responsible to school boards) handle finances, establish curricula, and allocate personnel, including the hiring, firing, promoting, and transferring of administrators and teachers. Few formal links exist between school districts. At the SEA level, states are legally vested with authority to provide for education, but state educational agencies exercise their responsibility in very different ways across the different states, and influence over local practices is marginal (Wirt and Kirst, 1972).

Seeking to influence this multitude of operational units is "federal policy." But federal policy is neither a single, unambiguous program nor a coherent doctrine administered by a dominant agency. It is a composite of funds, guidelines, legal requirements, and intents that are the result of political deliberations and consensus-building between the executive branch and Congress as well as within the Department of Health, Education and Welfare.

Moreover, a major lesson to be drawn from the past decade of federal intervention efforts in the area of education is that federal policies and mandates are not "self-executing"—that ratification of a legislative mandate concerning local behavior and practice does not always ensure a local response that is consistent with legislative intent (Wirt and Kirst, 1972). National traditions of federalism and pluralism protect local school districts from strong federal (or state) oversight or monitoring activities. Thus, the extent to which local districts use federal funds in accord with federal intent depends in large measure on local interests, incentives, and

priorities. It is unlikely that even an army of federal auditors could bring about local compliance with federal guidelines if these guidelines or federal objectives conflicted in important ways with local preferences. The practical and political consequence of this balance of power is that the success of federal initiatives—be they change agent programs or other federally financed objectives—relies ultimately on the response of the local education agency. In short, if governance depends on the capacity to get policies implemented, the balance of power in the education system resides at its base, the school district. An important consequence of this high degree of decentralization and local autonomy is that the focus of research on implementation should be on the school district.

SIMILARITIES OF THE LEA STRUCTURE AND PROCESS

Social scientists have begun to apply the concepts of complex organizations to the education system. Not only has the formal bureaucratic structure of schools and school districts been described but also various empirical and theoretical works have begun to characterize the informal organization of schools—the patterns of authority, communications, and interactions; the configuration of goals, beliefs, and motivations of individuals in various standardized roles (superintendents, principals, or teachers); and the structure of personal incentives and constraints that motivate individual behavior and limit individual action.[4] A major contribution of this literature is evidence that despite all the autonomy of LEAs, a common institutional framework links the various units of the elementary and secondary school system together into a highly stable system. That is, there is considerable similarity among organizations when they are compared laterally (from classroom to classroom, from school to school, from district to district, from state to state):

1. The formal authority relationships *within* classrooms, schools, school districts, and states are quite similar.
2. The formal authority links *between* the levels are quite similar.
3. At corresponding lateral levels, the roles played by individual actors (teachers, principals, superintendents, etc.), their incentive structures, and the organizational constraints on their behavior are similar.
4. The organizational ideology (the goals of educators and basic beliefs about how schooling should work) is similar throughout the system.
5. The pressures from the various public interests are similar.

The existence of this institutional framework implies that regardless of the considerable differences between school districts in such crucial areas as their student needs and characteristics, their political and cultural environment, their economic and social context, and their organizational and human resources, innovative projects will be exposed to similar structures within LEAs. Differences between, and within, school districts obviously affect how innovative projects are implemented; a subsequent section explores how these differences might be analyzed. Nonetheless, the underlying similarity in the structure of LEAs suggests that each case of implementation is not inherently idiosyncratic; suitable comparative analysis of the process may reveal systematic patterns of implementation.

[4] Janowitz, 1969; Anderson, 1968; Hawley, 1971; Bidwell, 1965; Gross et al., 1958.

DECISION POINTS AND IMPLEMENTATION PATH

We believe that the process of implementation can be systematically examined by describing and analyzing the sequence of important organizational decisions made during the life of innovative projects. In an almost tautological sense, all of the various activities and behaviors of individuals participating in a project involve "decisions." Yet some actions are particularly significant in that they imply a change in the ends or means of a project (March and Simon, 1958, p. 194). We refer to the decision to take, or not to take, such a critical action as a *decision point* (cf. Pressman and Wildavsky, 1973, p. xvi). The sequence of decision points over time might be called the *path of implementation* of an innovative project.

Though we cannot say at present which characteristics of implementation paths will prove the most fruitful for research, it seems plausible that such elements as the number and the spacing of decision points will be systematically related to both the "inputs" (e.g., characteristics of the project and the organization) and the "outputs" (e.g., the amount and significance of organizational change) of implementation. Moreover, answers to the following research questions should reveal much about these complex processes:

- What is the substance of the decision?
- Why is one alternative chosen rather than others?
- Who makes which decisions?
- Why do decision points arise when they do?

STAGES OF INNOVATION AND IMPLEMENTATION

It is important to realize that, at least in the context of innovations in education, implementation is an intermediate causal link in the more inclusive process of innovation. Many models of stages of innovation formulated in the literature assume a reality in which *rational* choices can be made, in which technological innovations can be transferred *invariantly* from adopter to adopter, and in which change is *internally* desired and generated. However, experience suggests that the institutional nature of school districts is quite different. Rather than rational choice, bureaucratic incentives and constraints and political opportunities and conflicts are the norm; rather than invariant transfer, innovative projects usually are adapted to the local setting; rather than internally generated pressures for change, educational systems typically initiate innovations because of outside forces. Accordingly, instead of the usual five-stage model of planned change developed by Rogers (1962),[5] we propose a three-stage process of innovation:

- Support
- Implementation
- Incorporation

The support stage includes more than the familar concepts of "search," "needs assessment," and "selection."[6] The introduction of an innovative project into a school or district requires a series of decisions by individual actors within the local

[5] Rogers' essentially "rational" five-stage model consists of (1) awareness, (2) interest, (3) evaluation, (4) trial, and (5) adoption (p. 81).

[6] The project selection that occurs at this stage probably involves the assemblage of a number of innovative ideas or practices into an innovative project, rather than selection or rejection of unitary innovative "packages."

policy system to support the proposed project. The decisions and considerations central in the support stage are essentially political; "cost" and "benefit" considerations at this stage are predominately institutional and personal, not budgetary. (High start-up costs may constitute a positive incentive to adopt an innovation since equipment or necessary training will be bought with outside funds.) In addition to the educational value of a proposed innovation, decisionmakers will have to consider the expected response of important interest groups, the amount of disruption or change implied for the school organization, as well as the short- and long-term benefits to the district. This concept of support assumes that information on new practices is a necessary but not a sufficient antecedent to the adoption of a particular innovation. A more important consideration is whether the "time is right" from the perspective of actors in the district. Without a high level of institutional support within the system for an innovative idea, it is unlikely that the process of innovation will get under way, despite the prima facie merits of the proposed change. Clearly, the commitments made in the support stage affect what happens when project implementation begins.

The term *incorporation* is used to denote the final stage in innovation—the point at which an innovative practice having been implemented loses its "special project" status and becomes part of the routinized behavior of the institutional system. The stage of incorporation (or failure to incorporate) is similar to the initial stage of the innovative process in the sense that support must be generated to institutionalize the project (in part or whole). Or, as Ford Foundation (1972) evaluators suggest: "Once inertia is reduced so that innovations are implemented, it may be necessary to establish a new stability that permits innovations to be maintained" (p. 37).

However, incorporation differs from the initial support stage in several major ways:

- Due to adaptation, the project as realized in the final stage is likely to be different from its initial conceptions.
- Because actors make decisions during the life of the project, a set of constituencies is created by subtle psychological processes of cognitive dissonance and less subtle political calculations of who gets what and who loses what.
- As the project moves from an experimental status to a legitimate permanent status, it gathers an organizational momentum on one hand and faces detractors threatened by dislocations on the other hand.
- New decision points relative to reallocation of personnel, redistribution of resources, and redesign of curriculum become established.

The incorporation stage represents the most serious commitment on the part of the district, as federal "seed money" is withdrawn and decisions must be made about not only *whether* but also *what components* of and on *what scale* a project should be incorporated into standard district practice. As in the support stage, cost/benefit questions are central. Few innovations will be incorporated as a district "add-on," but will constitute budgetary and pedagogical trade-offs. Considerations of vested interests, established routine, and marginal utilities take on much more importance at this time than at any other point in the process of innovation. Once again, the prima facie merits of the success of an innovative project will be only one factor considered. For example, continuation costs of critical parts of a project—such as paraprofessional salaries—may preclude district incorporation of a successful innovation. Like other stages of the innovative process, the incorporation stage comprises complex and far from straightforward decisions and issues. Ironically, the decisions made at this juncture often mean that an otherwise successfully imple-

mented project may fail from the point of view of institutionalizing change because the project terminates with the last federal check.

A CONCEPTUAL MODEL

The preceding sections discussed major concerns of research on understanding the process of implementation of educational innovations. But the same research issues can be treated in another complementary way. This section proposes a conceptual model that identifies major factors involved in change processes in a LEA. Rather than dealing with process, decision points, and implementation paths, we now turn to the question of how to systematically explain the variability in "outcomes" of innovative projects in terms of variations in the forces affecting projects.

Many impact studies reviewed in Sec. II implicitly assume a naive input/output view of change processes. In effect, the innovative project is an input to the black box of the educational system and produces an output of changed student outcome. Based on the discussion of the preceding sections, Fig. 1 proposes a conceptual framework or "model"—one of many possible models—that unpacks the black box. The model is illustrative; its purpose is to specify how we view the interrelationships between the project, its setting, and the effects of the project. The model is built around the three stages of the change process—support, implementation, and incorporation—evoked by an innovative project. We shall discuss each stage in turn.

We assume that the *support* for a particular innovative plan will be a function of the initial characteristics of the plan, of the institutional characteristics of the LEA, of the characteristics of the community in which the LEA is embedded, and of federal and state policy. Support, as a vector of dependent variables, might be operationalized in terms of various measures of (1) the *resource commitment* of the LEA to the innovative project (local funding allocated to the project and the quantity and quality of staff development) and (2) the *personal backing* of individual actors (superintendent's and principal's expressed support and teachers' voluntary willingness to participate).

Federal and state policies provide various incentives to the local school district to support innovative projects. A broad goal of the overall Rand study is to suggest how federal policy *can* effect change and with what policy instruments. We deal with this question in two ways. First, we can examine directly how federal policy *has* affected LEAs. In particular, for the analysis of support, federal policy inputs can be operationalized (1) in broad terms by comparing ESEA Title III (state and federal), Vocational Education, ESEA Title VII (bilingual), and Right To Read; and (2) in specific terms of variables cutting across and within programs (levels of funding, guidelines, or restrictions). Similar remarks apply to comparative SEA analyses.

However useful such analyses might be, they are unlikely to provide a definitive guide to the broad question of devising appropriate change policy. Such direct empirical analysis deals with what is or has been. But since the range of policy instruments represented in present programs is narrow, what *is* may be different from what could be. In short, it is possible that, in the brief period of federal attempts to foster innovation in elementary and secondary education, the "best" policy has not yet been devised. In terms of our model, we propose that federal policy exogenously influences the support for an innovation and its incorporation but does not affect the process of implementation; this identification reflects the finding of The Ford Foundation (1972) and others that funding agencies have an effect primarily at the initial stage. Yet policy could affect implementation if appropriate policy instruments were applied to those aspects of the institution susceptible to change. Of course, an object

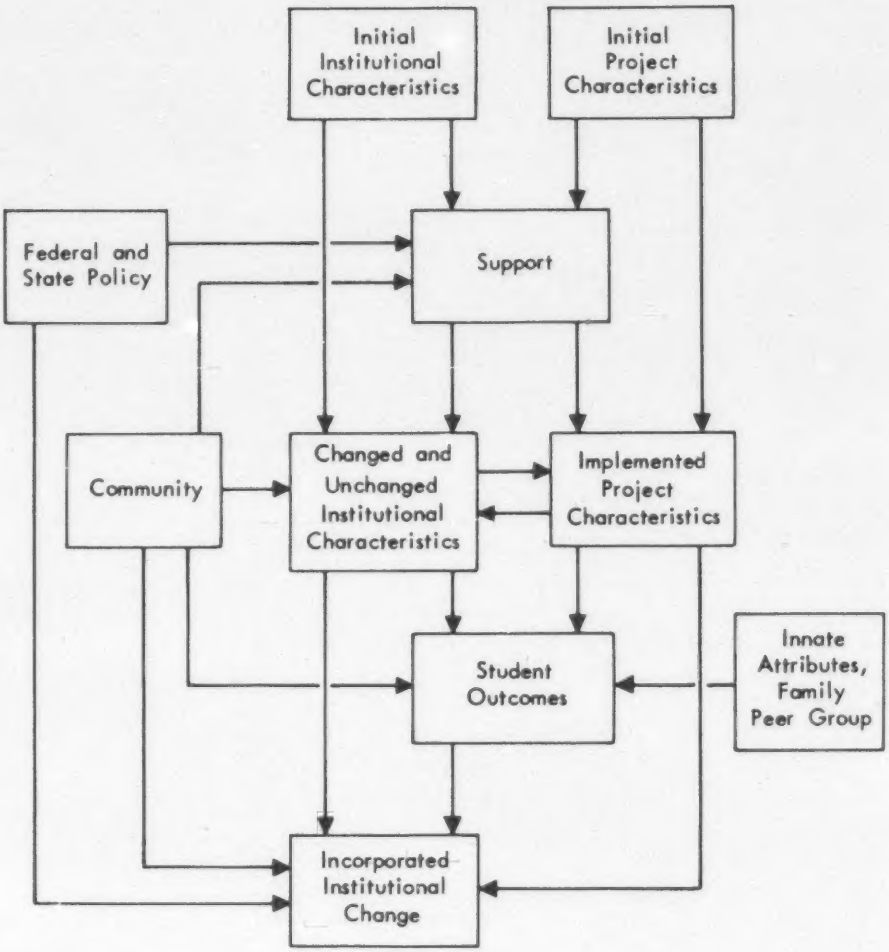

Fig. 1—Schematic diagram of factors affecting change in the LEA

of research is to locate these policy levers by pursuing the lines of inquiry suggested by Fig. 1 and the preceding sections.

The demographic and political characteristics of the community in which the LEA and its constituent schools are located affect support by producing *pressure* for change, by *constraining* the possibilities of change, and by presenting the *need* to change in the characteristics of the student population. Urban rural composition, ethnic and racial composition, community size, median age of residents, and tax base represent relevant demographic characteristics whose effects need to be explored; the level of unrest in the community, the level of community involvement in school affairs, and the type of school board are relevant political characteristics.

Institutional characteristics can affect support in a wide variety of ways, and, of course, determining the extent to which candidate characteristics have significant

effect is an objective of research. For convenience, institutional characteristics can be divided into *organizational status, attributes of principal actors,* and *organizational capacity to innovate.*

Organizational status measures might include[7]

- Wealth
- Level of per pupil expenditure
- Amount of budgetary slack
- Pattern of resource use
- Size
- Age and condition of facilities
- Racial and socioeconomic-status composition
- Pupil per teacher ratio
- Staff mobility patterns
- Staff age patterns
- Number of graduates entering college
- Dropout rate

Attributes of such principal actors as the superintendent, principal, and project directors might include

- Innovativeness propensity (an index of (1) the number and rate of widely diffused educational practices in the district and (2) the nature and number of simultaneous new educational practices in the district).
- Locus of decisionmaking (for budget decisions, curriculum, and allocation of resources and personnel).
- Research and development capacity.
- Leadership styles (authoritarian, democratic, etc.).

Figure 1 distinguishes between initial project characteristics and implemented project characteristics. The initial project itself is a plan consisting of a statement of goals and means usually justified in terms of the needs of its target group. In addition, the innovative project implies personal consequences for individual actors that affect their willingness to support the project. Developing adequate conceptualizations of these project characteristics presents a major challenge to the Rand study. We believe that project characteristics can be usefully divided into *perceived educational objectives, perceived personal consequences, perceived institutional effects,* and *project techniques and strategy.*

The category of perceived institutional effects requires especially careful conceptualization since operational measurements that are too fine-grained may lead to classifying each project as unique. Higher level concepts may provide groupings that allow generalizations; for example,

- Centrality (the degree of displacement of central and routinized behavior that might accompany incorporation of an innovation project).[8]

[7] During research, these measures need to be differentiated according to the institutional level pertinent to the innovative project. Thus, some variables might be measured for the school district or individual schools or individual classrooms or grade levels or a combination of these levels.

[8] The education literature discusses the concept of centrality in terms of "mainline" versus "ancillary" innovative strategies. The addition of an art appreciation project, or the introduction of a zoo education program, might be examples of ancillary change. Incorporation of these programs in a district's menu of educational services, despite the effectiveness of the project in meeting its own goals, will result in little change in the core institutional practices or patterns of behavior. Because these projects have little centrality, they represent only marginal change in district routine. The new math curriculum or differentiated staffing strategies, on the other hand, are mainline innovation efforts. They are concerned with

- Consonance (the degree of congruence, fit, or compatibility between the perceived goals and practices of an innovative project and pre-existing institutional characteristics).

However, since these variables are difficult to operationalize, a typological approach to classifying the perceived institutional effects of a project might be more useful. For example, a scheme suggested by Pincus (1974) categorizes projects into the type of change being attempted:

- Change that increases the level of resource use only.
- Change that affects the resource mix.
- Change that affects instructional processes or methods without altering resource level or mix.
- Change that affects administrative management without significant alterations of the organizational power structure.
- Change that affects either the organizational structure of the school or the school's relation to external authority.

The implementation phase is reflected in Fig. 1 by the various relationships between student outcomes, institutional changes, and project changes.

We assume that the project (and the changes it causes in the institution) is only *one* of the factors affecting student outcomes. Indeed, it may be a *marginal* factor. Student outcomes (however measured) are the result of the student's innate endowments, influence from the family, peer group, and community, and the characteristics of school experience not affected by the project (Levin, 1971). Unfortunately, estimating these effects on student outcomes is an extremely difficult task. Nonetheless, analysis of student outcome is necessary even if it is limited to measuring the changes in student performance or attitude relative to the situation before the project began. A standardized measure, such as achievement levels on cognitive tests, would not be desirable (or feasible) for all projects, since the educational objectives of change agent projects differ widely. Instead, operational procedures need to be devised that measure the degree to which objectives, whether stated or implied, are met *relative* to the *initial level of the target group* on these objectives. Such measures will probably be aggregate measures of the target group performance (rather than either individual measures or overall school district measures). Moreover, they may necessarily rely on the perceptions and judgments of local participants in the project. To reduce some of the obvious bias involved in these indicators, composite measures that average or weight the various perceptions of actors at the same and at different levels might be useful.

Characteristics of the institution may change as a result of the innovative project. These changes may be those anticipated by the initial project plans or unanticipated consequences of implementation. Significant organizational changes may occur if there are alterations in *routinized procedures*, in the *loci of decision-making*, in the *roles of individual actors*, and in the creation of *specialized and differentiated staff*. Direct, or proxy, measures of these institutional effects may be useful. In addition, given the need for comparability, the operationalization of more abstract concepts such as the degree of centrality may prove fruitful.

Figure 1 also suggests that community characteristics may influence institutional outcomes. These community characteristics would include attributes that change

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the core of a district's instructional program and require—if they are to be successful—substantial reorientation and new learning on the part of teachers and district personnel. Of course, school districts often employ ancillary projects for strategic purposes. For example, an ancillary project may be adopted to pave the way for more basic change.

exogenously during the life of the innovative project as well as those that do not.[9] For some projects that require high levels of community involvement, it may be necessary to consider the simultaneous effect of the project on the community.

As previously argued, the initial plans of a project become developed, operationalized, and altered during its implementation. Figure 1 proposes that the implemented project is a function of the characteristics of initial plans, of those aspects of the institution changed by the project, of those aspects of the institution *not* changed by the project including elements that resisted change as well as those features exogenous to the implementation, and of the support for the project.

Among those initial characteristics of the project expected to affect implementation (in addition to factors previously cited) are such elements of technique and strategy as

- Prior planning and testing
- Specificity of goals and means
- Flexibility
- Complexity
- Allocation of resources
- Staff development

Among the institutional characteristics (in addition to those previously cited) that might affect implementation are

- Degree of principal and/or superintendent *involvement, support,* and *accessibility*
- Degree of reciprocity within schools
- Degree of staff participation in decisionmaking
- Teachers' perception of autonomy or activity control

Unlike the support stage, the incorporation of a project by a LEA can draw on the project's actual performance, effects, and history, and can reflect an evaluation of the costs and benefits of the project relative to other alternatives. One indicator of incorporation might be the decision of the LEA to *continue* an innovative project after federal funds have been exhausted. However, in using this indicator, care has to be taken to differentiate which aspects are being continued and to what extent. At a more abstract level, incorporation might be measured by the degree to which it involves (1) *incremental* changes to established routines, (2) *expansions* of the existing repertoire by new elements, or (3) *replacement* of previous institutional patterns of behavior.

To summarize, we have proposed a conceptual model of factors affecting change processes in a LEA and various potential measures of these factors. Though this model undoubtedly will be revised as the research proceeds, the critical concepts, propositions, and system of relationships suggested by the model and by the discussion of preceding sections should help formulate operational procedures for understanding how the educational system implements innovations.

[9] For example, since local educational systems are accountable to the local and national community, the weights and priorities assigned to various goals and objectives at any given time can be expected to change as values and preferences shift in the broader policy setting. Even if a clearly defined set of educational objectives could be specified, it would be risky (and an insurance of obsolescence) to take them as a "given" or a single standard to employ in the construction of theory or in the development of measurement instruments.

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